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Checklist of the Amphibians and Reptiles of the Madre Selva II Biological Reserve of Loreto, Peru

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Introduction

During the past 20 years several herpetological investigations have taken place throughout much of the Amazonian basin (Duellman and Mendelson, 1995). These investigations have provided some insight into the taxonomy and distribution of that region's amphibians and reptiles. However, our knowledge is still fragmentary, and an accurate assessment regarding distribution and speciation can only be made after more sites have been intensively studied (Duellman and Thomas, 1996).

The purpose of this report is to provide information regarding the abundance, diel activity, and habitat utilization of the 138 species of amphibians and reptiles documented from the Madre Selva II Biological Reserve, Departamento Loreto, Peru.

Study Site

The 200-hectare Madre Selva II reserve was established in 1994, and is maintained by Project Amazonas. Project Amazonas is an established nonprofit organization committed to preserving biodiversity within the Amazonian rainforest, while assisting local communities with various humanitarian efforts (e.g., medical supplies, education, etc.). The site is located on the southern banks of the Río Orosa, and is about 125 km by air east of Iquitos.

Approximately 50 ha of forest within the reserve have never been harvested for lumber or cleared for agricultural use. The remaining 150 ha of forest is largely comprised of old regrowth while a small portion (approx. 10 ha) is newly regrown from previous agricultural use. The reserve experiences a wet season that begins in October and lasts until April. During that time, as much as 70% of the forest is flooded. Currently, there are no long-term rainfall records available for the region. It is likely that annual rainfall corresponds with that of Iquitos (3050 mm of rain per year; Dixon and Soini, 1986). The dry season begins in May and lasts until October with July and August being the driest months. Daytime high temperatures during this study ranged from 24 to 36°C.

Methods

A herpetological survey of the Madre Selva II Biological Reserve was conducted from November 1997 to February 1998. Three groups of investigators inventoried the diversity and abundance found at the study site. Prior to this endeavor, there has been no systematic survey of the herpetofauna occurring in or near this reserve.

One 900-meter-long trail was opened in 1996. The trail is approximately 1 m wide and marked at 50 m intervals. Efforts were divided between daytime and nighttime field work. This yielded an estimated 300 person-hours in the field. A total of 48.6 km was traversed on foot in search of specimens during the course of this study. Collecting restrictions prevented investigators from obtaining preserved material for future review. However, investigators photographed specimens and documented their abundance, diel activity, and habitat utilization.

The taxonomy and classification used herein follows the summaries made by Duellman (1993) for anurans, Peters and Donoso-Barros (1970) for lizards and amphisbaenians, except as updated by Frost and Etheridge (1989), Frost (1992) and Avila-Pires (1995). Taxonomy for snakes follows Peters and Orejas-Miranda (1970), except for pitvipers, which follows Campbell and Lamar (1989).

Summary

During the survey, 128 species of amphibians and reptiles were documented from the Madre Selva II Biological Reserve in Departamento Loreto, Peru. Others who had visited the site either before or after this survey have documented ten additional species. This increased the total number of species to 138. Amphibians comprised 48% of the species documented. Amphibian diversity was composed of eight families and 64 species (one caecilian, two caudates, and 61 anurans). Fifty percent of the amphibian species observed belong to the family Hylidae. One significant amphibian range extension was discovered. The frog species *Eleutherodactylus orphnolaimus*, which had been previously reported from Santa Cecilia, Ecuador (Duellman, 1978), was found at the reserve. This is the first account of this species from Loreto, Peru. Reptiles comprised 52% of the herpetofauna found, and represented 18 families and 74 species.

Acknowledgments

This project could not have been possible without the help of several persons. Devon Graham provided assistance in the field. Albert Slugocki and Fernando Rios of Project Amazonas assisted us with our travel logistics to and from the study site.

I wish to thank William L. Lamar for arranging meetings with the government biologist of Loreto, Peru; Pekka Soini for his hospitality; and James R. Dixon for reviewing photographic materials. I also wish to thank Lyndon A. Mitchell, William E. Duellman, and Linda Trueb for reviewing photographic materials, and their helpful comments during the preparation of the original draft of this manuscript. A special thanks is also due to Jonathan A. Campbell for all of his encouragement and helpful advice regarding both this project and the original draft of this manuscript. Eric N. Smith provided invaluable information regarding the genus *Osteocephalus*, and reviewed photographic material of this perplexing frog.

I would also like to thank Donal M. Boyer, Greg Dimijian, Brad Smith, David M. Schleser, the staff of Project Amazonas, and the staff of the Dallas Zoo herpetarium for assisting in data collection. Last but not least, I would also like to thank Jacqueline Franklin, and Jose and Elena Cervantes for reducing the chances of an international faux pas by expertly translating letters from English to Spanish.

Amphibians and reptiles found at the Madre Selva II Biological Reserve, Loreto, Peru.
Abundance: C = common; U = uncommon; R = rare, species represented by five or fewer individuals found. Diel activity: D = diurnal; DH = diurnal heliophilic; DS = diurnal shade; N = nocturnal; ND = nocturnal and diurnal. Habitat selection: A = aquatic; AM = aquatic margins; B = bushes (<1.5 m); E = edificarian (associated with human structures); F = fossorial; G = ground; L = logs; LL = leaf litter; TB = tree buttresses; TL = tree limbs; TT = tree trunks.

Taxon	Abundance	Diel activity	Habitat selection
AMPHIBIA			
Anura			
Bufonidae			
Atelopus spumarius	R	DS	G
Bufo glaberrimus†	R	?	?
Bufo marinus	C	N	G,LL,TB
Bufo typhonius	C	ND	G,LL,L,TB
Dendrophryniscus minutus	U	N,DS	G
Dendrobatidae			
Colostethus marchesianus	R	DS	G,LL
Dendrobates ventrimaculatus	C	DS	G,LL
Epipedobates hahneli	C	DS	G,LL,L,TB
Epipedobates trivittatus	C	DS	G,LL
Hylidae			
*Agalychnis craspedopus**	R	N	TL
Hemiphractus johnsoni†	R	N	TL
Hyla albopunctulata	U	N	AM
Hyla bifurca	U	N	B,TL
Hyla boans	U	N	AM,TL
Hyla brevifrons	R	N	TL
Hyla calcarata	C	N	TL
Hyla fasciata	C	N	TL
Hyla geographica	C	N	TL
Hyla haraldschultzi	C	N	TL
Hyla lanciformis	C	N	TL
Hyla leucophyllata	C	N	AM
Hyla microderma	R	N	TL

Amphibians and reptiles found at Madre Selva II (cont'd)

Taxon	Abundance	Diel activity	Habitat selection
Hyla miyatai	U	N	L
Hyla parviceps	U	N	AM,TL
Hyla punctata	C	N	AM,TL
Hyla triangulum	C	N	AM,TL
Osteocephalus cabrerai	R	N	TL
Osteocephalus leprieurii	C	N	AM,TL
Osteocephalus planiceps	C	N	AM,TL
Osteocephalus taurinus	C	N	AM,TL
Phrynohyas resinifictrix	U	N	TT
Phrynohyas venulosa	C	N	AM,TL
Phyllomedusa tomopterna	R	N	TL
Phyllomedusa vaillanti	R	N	G
Scarthyla ostinodactyla	R	N	AM
Scinax cruentomma	R	N	TL
Scinax funerea	C	N	TL
Scinax garbei	C	N	AM,E,TL
Scinax rubra	C	N	AM,E,TL
Sphaenorhynchus dorisae	C	N	AM
Leptodactylidae			
Adenomera andreae / hylaedactyla‡	C	N	G
Edalorhina perezi	C	DS	G,LL,TB
Eleutherodactylus acuminatus	U	N	TL
Eleutherodactylus altamazonicus	C	DS	LL
Eleutherodactylus carvalhoi	C	N	TL
Eleutherodactylus conspicillatus	U	DS	G
Eleutherodactylus malkini	U	N	TL
Eleutherodactylus martiae	C	N	TL
Eleutherodactylus ockendeni	C	N	TL
Eleutherodactylus orphnolaimus	R	N	TT
Eleutherodactylus peruvianus	R	N	G
Eleutherodactylus sulcatus	C	DS,N	B,G,TL
Eleutherodactylus variabilis	C	DS,N	B,G,TL
Ischnocnema quixensis	C	N	B,G
Leptodactylus pentadactylus	C	N	G,TB

Amphibians and reptiles found at Madre Selva II (cont'd)

Taxon	Abundance	Diel activity	Habitat selection
Leptodactylus stenodema	R	N	G,TB
Lithodytes lineatus	R	N	G,TL
Physalaemus petersi	C	DS	G,LL
Microhylidae			
Chiasmocleis bassleri	U	N	LL
Hamptophryne boliviana	U	N	G
Pipidae			
Pipa pipa	R	?	A
Caudata			
Plethodontidae			
Bolitoglossa altamazonica	C	N	TL
Bolitoglossa peruviana	C	N	TL
Gymnophiona			
Caeciliaidae			
Oscaecilia sp.†	R	?	?
REPTILIA			
Crocodylia			
Alligatoridae			
Caiman crocodilus	C	N	A,AM
Caiman niger	R	N	A,AM
Paleosuchus trigonatus†	R	DS	AM
Amphisbaenia			
Amphisbaenidae			
Amphisbaena alba†	R	?	?
Squamata: Sauria			
Gekkonidae			
Gonatodes concinnatus	C	D,DS	L,TB,TT
Gonatodes humeralis	C	D,DS	L,TB,TT
Hemidactylus mabouia	R	N	E
Pseudogonatodes guianensis	C	D,DS	L,TB,TT
Thecadactylus rapicaudus	R	N	TT
Gymnophthalmidae			
Alopoglossus angulatus	C	DS	G,LL
Alopoglossus atriventris	C	DS	G,LL

Amphibians and reptiles found at Madre Selva II (cont'd)

Taxon	Abundance	Diel activity	Habitat selection
Iphisa elegans	C	DS	G,LL
Neusticurus ecpleopus	C	DS	AM,G
Prionodactylus argulus	C	DS	G,LL
Prionodactylus oshaughnessyi	U	DS	LL
Hoplocercidae			
Enyalioides laticeps	C	DS	TL,TT
Iguanidae			
Iguana iguana	U	D	TL
Polychridae			
Anolis bombiceps	C	DS	B,TL,TT,L
Anolis fuscoauratus	C	DS	B,TL,TT,L
Anolis nitens	C	DS	B,TL,TT,L
Anolis ortonii	C	DS	B,G
Anolis punctatus	U	DS	TL
Anolis trachyderma	C	DS	B,TL
Anolis transversalis	C	DS	B
Polychrus marmoratus	U	DS	TL
Scincidae			
Mabuya nigropunctata	C	D	B,G,L,LL
Teiidae			
Ameiva ameiva	C	D	G,L
Crocodilurus lacertinus	C	D	A,AM
Dracaena guianensis	R	D	A,AM
Kentropyx altamazonica	C	DS,DH	G,L
Kentropyx pelviceps	C	DS,DH	G,L
Tupinambis teguixin	C	DS	AM,G,L
Tropiduridae			
Stenocercus fimbriatus	C	DS	G,LL,TL
Tropidurus plica	C	DS	TL,TT
Squamata: Serpentes			
Aniliidae			
Anilius scytale†	R	?	?
Boidae			
Boa constrictor	C	N	G,TL

Amphibians and reptiles found at Madre Selva II (cont'd)

Taxon	Abundance	Diel Activity	Habitat selection
Corallus hortulanus	R	D	AM,TL
Epicrates cenchria†	R	N	?
Eunectes murinus	C	D,N	A,AM
Colubridae			
Atractus elaps	U	N	G
Chironius carinatus	U	D	TL
Chironius multiventris	U	D	TL
Chironius scurrulus	U	D	TL
Dendrophidion dendrophis	U	D	G
Dipsas catesbyi	C	N	TL
Dipsas indica	C	N	TL
Drymoluber dichrous	R	N	G
Helicops angulatus	C	N	A,AM
Helicops leopardinus	C	N	A,AM
Hydrops martii†	R	N	AM
Imantodes cenchoa	C	N	TL
Leptodeira annulata	U	N	TL
Leptophis ahaetulla	R	?	G
Oxybelis fulgidus	R	?	?
Oxyrhopus melanogenys	R	N	TL
Oxyrhopus petola	R	N	G
Oxyrhopus trigeminus	R	N	TL
Pseudoboa coronata	R	D	TL
Spilotes pullatus	R	D	G
Taeniophallus brevirostris	R	N	G
Tripanurgos compressus	C	N	TL
Elapidae			
Micrurus filiformis	?	?	?
Micrurus lemniscatus†	R	N	?
Micrurus putumayensis	R	N	G
Micrurus surinamensis	R	N	A
Viperidae			
Bothrops atrox	C	N	AM,G,LL,TL
Lachesis muta†	R	D	G

Amphibians and reptiles found at Madre Selva II (cont'd)

Taxon	Abundance	Diel activity	Habitat selection
Porthidium hyoprora	R	D	LL
Testudines			
Chelidae			
*Chelus fimbriatus**	R	?	A
*Platemys platycephala**	R	?	A
Pelomedusidae			
*Podocnemis expansa**	U	?	A
Podocnemis sextuberculata†	U	?	A
*Podocnemis unifilis**	R	?	A
Testudinidae			
*Geochelone denticulata**	R	?	?
Total = 138 species			

* Specimens from local areas outside the reserve during the survey.

† Documented species from prior visits to the site.

‡ These two species cannot be distinguished using external morphological characteristics.

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Some Bizarre Effects on Snakes, Supposedly from Pollution, at a Site in Pennsylvania

Brian Gray[1], Hobart M. Smith[2], John Woodling[3] and David Chiszar[4]

Abstract

Abnormally frequent occurrence of merolepidosis, and uniquely of mandibular agenesis, in *Thamnophis s. sirtalis* (Linnaeus) collected at an EPA-designated hazardous waste site near Erie, Pennsylvania, appears to be the result of toxic pollution persisting even after partial restoration of the site. Both types of anomalies are likely products of hormonal disruption, whereas the anomalies of somatodichotomy and kyphosis are of genetic and physical origin. Anomalies such as those reported here suggest that in snakes a divided anal scale is plesiomorphic, and an entire one is apomorphic.

In snakes, the commonest morphological anomalies are somatodichotomy ("Siamese twins"-like abnormalities; literature summarized in Smith and Pérez-Higareda, 1987, and in Swanson et al., 1997), merolepidosis (partial scalelessness; literature summarized in Smith et al., 1996, 2000) and kyphosis (Frye, 1991; an example and literature review in Smith and Fitzgerald, 1983). These and other anomalies may accompany the rare occurrence of facultative parthenogenesis (Smith et al., 2000), but they are most often attributed to "abnormal incubation temperatures" (Frye, 1991) or to other naturally occurring genetic irregularities or stresses like dehydration or physical injury occurring during development.

We here report an anomaly never before recorded in snakes, in company with several cases of merolepidosis occurring within a limited area. Collectively these anomalies seem highly likely to be a result of toxic pollution.

The area is an 80-acre site in Millcreek Township, Erie County, Pennsylvania, which served as an "unpermitted active landfill" for forty years, from 1941 to 1981. In 1981, construction was started on a flood retention basin, but in that process hazardous materials were discovered, prompting the United States Environmental Protection Agency (EPA) to close the landfill. In 1984 the site was placed on the National Superfund Priority List. In subsequent work, which continues to the present time and is incomplete, seventy-five drums of hazardous liquids, along with 364 drums of nonhazardous materials, were removed, and an abandoned gas well was plugged. Junk removed included hundreds of tires, refrigerators and other appliances, huge chunks of concrete, and even a 17-foot boat.

Current plans are to convert sixty-four acres to a golf course that will include a flood retention basin. Once most of the contaminated soil is removed, a 12-inch cap of clean soil is to be placed over the entire area, after which presumably no toxin will be present at least superficially. What if any will remain at lower levels will at least he greatly diminished from initial concentrations.

EPA analyses of pollutants at the Millcreek Hazardous Waste Site in 1981–2 revealed presence of several mutagenic compounds, including lead, chromium, mercury, phenols, polynuclear aromatics, methylene chloride and aldehydes, in combinations of surface water, ground water, surface and subsurface soils. Lead, chromium and mercury exceeded levels measured in samples from adjacent "background" locations (NUS, 1985). Lead ranged from 16 mg/kg to 1,756 mg/kg, chromium from 9.5 mg/kg to 820 mg/kg, and mercury from 0.1 mg/kg to 3 mg/kg.

Observations on abnormalities in eastern garter snakes [*Thamnophis s. sirtalis* (Linnaeus)] from the Millcreek Site that might be linked to environmental toxins were made by one of us (BG) from 1995 to 2000, as follows:

1. A 482 mm TL normal female collected 21 April 1995 gave birth 14 July 1995 to eleven young, one of which (UCM 61078) exhibited mandibular agenesis (Figure 1), whereas the others were normal. The jawless specimen, which died shortly after birth, is normal except for the complete absence of the lower jaw. The supralabials are turned inward, fused with the palate and covering the maxillae. Two pairs of scales and two median ones precede the ventrals, and the anterior median scale is fused with the rear end of the palate. The palatopterygoid bones and teeth are present and exposed.

2. On 24 June 1997 a normal, gravid female, 657 mm TL, was collected and subsequently maintained in captivity under herpetoculturally favorable conditions. On 10 August 1997 it gave birth to eighteen young, one of which was merolepid. That individual was maintained alive, molting with difficulty, until it died 2 September 1997, when it was preserved and subsequently sent to Dr. Arthur Hulse at Indiana University, Indiana, Pennsylvania.

That specimen (now UCM 61080) proved to be more or less typical of the merolepid condition. The ventrals are mostly normal, except that the anal and several preceding ventrals are divided medially. the subcaudals are present except near the tip of the tail, but throughout are highly irregular, subdivided in as many as four scales for each segment, but reduced to paired nubbins near the end of the tail. Much as in other merolepid snakes, the dorsals are completely missing, and the head scales are missing except for small vestiges of the supraoculars, prefrontals and internasals (both represented by oval nubbins

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4. Psychology and Museum, University of Colorado, Boulder, CO 80309-0345.

Figure 1. Ventral view of the head and neck of the 1995 amandibular neonate described in No. 1 above.

close the canthus), and reduced and irregular supralabials and infralabials. The chinshields may be represented by a few elongate nodules near the middle of the gular region.

The pattern is the same as depicted for other snakes in Figure 2, including a conspicuous paraventral row of dark spots.

Another snake (UCM 61081) from the same litter, stillborn and preserved shortly after birth, accompanied the merolepid snake. It appears to be normal in all respects, including an entire anal scale.

3. An adult male collected in 1995 was placed with the above female, and they were observed copulating 22 October 1997 and, after brumation, 26 February 1998. No young were produced that year. After brumation in the winter of 1998-9, they were observed copulating again 6 March 1999. On 28 May 1999 the female gave birth to seventeen young, one of which (UCM 61074) was stillborn and merolepid; the rest were normal, including UCM 61071-3.

The merolepid snake (92 mm TL, tail 20 mm) is aberrant not only in lacking dorsal and most head scales, but also in having no subcaudals whatever, a divided anal (as in the merolepid specimen of *T. elegans vagrans* reported by Smith et al., 1996), and highly irregular ventrals some 110 in number, far

Figure 2. Dorsal view of two merolepid snakes, stillborn 26 May 2000, and described in No. 5 above.

fewer than normal (142–151; McCauley, 1945). Some ventrals are abnormally short, some divided, some on only one side. Supraoculars 1-1, a small oval in anterior position; 3-3 preoculars; one tiny loreal on one side; 11-11 supralabials, not reduced in size posteriorly; 9-11 infralabials, reduced and incomplete posteriorly. The pattern is much as shown in Figure 2 for other merolepid specimens, essentially normal but the dark spots much more prominent than in normal snakes, not being obscured by scales. The dark spots in the paraventral row are also much more evident than in normal specimens.

4. A normal, ~600 mm TL female was collected in June 1997 and gave birth 14 August 1997 to fourteen young, all normal but three were stillborn.

5. The 657 mm female of No. 2 above was artificially brumated over the winter of 1999–2000, and in spring 2000 four males from the 1997 litter (No. 2 above) were placed with her for about a week. She gave birth 26 May 2000 to twenty-eight young, three of which were male merolepids, two stillborn (Figure 2). The live merolepid snake (Figure 3) was kept until it died 12 August 2000, feeding in the interim on guppies and earthworms.

That specimen, now UCM 61077, 258 mm TL, tail 61 mm, has 153 ventrals, normal for males of the subspecies (McCauley, 1945). The anterior three ventrals are abnormally divided into two or three unequal scales; the anal is half its normal width and divided (abnormal); the preanal is unequally subdivided into four scales, and the next anterior is divided into two equal parts. The posterior gulars, anterior to the ventrals, form a triangular patch, apex forward, of contiguous scales tending toward an ovoid shape.

On the head, all scales are missing except for 2-3 tiny oval supraoculars against the orbit; preoculars large, 1-2; two small, oval canthals; nasal more or less normal; an ovoid rostral; 12-12 very irregular, partially subdivided supralabials, 9-9 infralabials; an oval mental. A tiny, ovoid scale at one side on the throat.

The pattern is essentially as illustrated here (Figure 2) for the stillborn pair, surprisingly near normal as compared with the photographs of merolepid snakes of other species (Smith et

Figure 3. Lateral view of the head and neck of the neonate born 26 May 2000, maintained alive for nearly three months, and described in No. 5 above.

Figure 4. Ventral and lateral views of the head and neck of the three amandibular neonates born 15 May 2000 and described in No. 6 above.

al., 1996, 2000; Bechtel, 1995) and descriptions in the latter work. The pattern conforms with illustrations of normal individuals of the subspecies (see especially Schmidt and Davis, 1941:254), except for the greater prominence of the dorsal dark spots.

One of the stillborn young (UCM 61076), 170 mm TL, tail 43 mm, has 147 ventrals, all normal; anal divided, in two separate parts; hemipenis base on one side normal, on the other side attached to the posterior edge of the anal scale; subcaudals 18-20, in two separate rows, confined to the base of the tail, with a few nubbins between the scale rows; the rest of the tail is scaleless. The head scales are much like those of the live sibling, except 1-1 small, ovoid supraoculars; 1-1 small, ovoid preoculars; 13-15 very irregular, ovoid supralabials, diminished anteriorly; 8-9 infralabials, diminished posteriorly; mental width normal but a median posterior indentation.

The other (Figure 2) stillborn young (UCM 61075), 173 mm TL, tail 43 mm, has 151 ventrals, and a divided anal. The subcaudals in the basal 5 mm of the tail are nubbins in four rows, in contact; the next 10 mm has three rows, followed by two rows, separated only distally, up to the terminal 6 mm, which are scaleless. A series of tiny nubbins encircle the top half of the orbit; 11-14 supralabials and 11-12 infralabials, both series diminished posteriorly; mental subtriangular; posterior gulars forming a triangular patch as in UCM 61077.

6. A captive-maintained female from the 14 August 1997 litter (No. 4 above), was bred to a wild-caught male in fall 1999, and on 15 May 2000, at 663 mm TL, gave birth to twelve young, three of which, two females and a male, had mandibular agenesis (Figure 4), and died shortly after birth. These were sent to Dr. Fredric L. Frye and Associates (875 South Orchard, Suite 4, Ukiah, California 95482-7448) and are not at present available. It is apparent from the photograph that the lower]aw is represented by a short, tubercular remnant over the posterior end of the palate. No such remnant is evident in the amandibular specimen described above (No. 1).

Discussion

Summaries of the astonishingly varied morphological abnormalities recorded in reptiles appear in Bechtel (1995) and Frye (1991). None have been shown conclusively to be a result of contaminants, but considerable evidence exists that contaminants incur various disruptions with resultant effects upon metabolism and reproduction in a variety of reptiles.

Some and perhaps most if not all deleterious effects of pollution appear to be endocrinologically mediated (Bishop et al., 1994; Guillette et al., 2000). As stated in the latter work "The endocrine system exhibits an organizational effect on the developing embryo." Examples of such toxinogenic anomalies include alligators (Pickford et al., 2000; Guillette et al., 2000), snapping turtles (Bishop et al., 1994). slider turtles (*Trachemys scripta;* Lamb et al., 1995). snakes (summarized by Campbell and Campbell, In press) and lizards (summarized by Campbell and Campbell, 2000). The anomalies here reported appear similarly to be caused by developmental disruption.

None of the toxicological works on snakes reveal morphological anomalies such as those reported here, no doubt because such individuals almost always die at or shortly after birth or hatching, hence are seldom found in the wild, where most animals examined for effects of toxins are taken.

However, Hopkins (2000) noted the rarity of toxicological studies in reptiles in general—about 1.1% (12 in a total of 984 studies on vertebrates in general over a ten-year period (1990–1999). Such studies are sorely needed to determine objectively to what extent pollution is responsible for the widespread decline of reptiles (Gibbons et al., 2000). Investigation of normal levels of extraneous substances in snakes are important for comparative purposes; one such study is that of Bauerle et al. (2000).

No data exist comparing reptilian with mammalian susceptibility to toxins or mutagenic factors, but some evidence exists (Pauli and Money, 2000) that some lizard and turtle species are as sensitive to organophosphorus pesticides as bird species. Snakes may thus be as sensitive to various classes of mutagenic compounds and toxicants as other vertebrates.

Although normal mutation might account for part of the abnormalities here reported, the frequency at the Millcreek site of occurrence of stillborn, merolepid and amandibular neonate snakes, as opposed to their rarity elsewhere, suggests an abnor-

mal rate, the most obvious source of which is the toxic pollution known to have occurred in the Millcreek habitat. Strangely, no cases of somatodichotomy or kyphosis have been discovered among the Millcreek anomalies, suggesting that different causative factors may be involved, perhaps injury during development in cases of kyphosis, and genetic errors in cases of somatodichotomy. Conclusive proof of contaminant sources for the anomalies here described will depend upon analyses of body tissues.

Lack of data is the largest impediment in the use of snakes as ecological receptors in any environmental assessment. Many species of snakes seldom move outside the parameters of a one kilometer range (Hirth et al., 1969), hence might be ideal indicators of mutagenic pollutants on a localized scale.

It will be of great interest to monitor the frequency of occurrence of abnormalities once the area has been restored to supposed normalcy—if indeed the snakes survive the restoration. Much of the deciduous forest and old field habitat (including two known den sites) have been destroyed. Nevertheless, comparative studies of deformities such as those associated with *T. s. sirtalis* at the Millcreek Site as opposed to those in adjacent uncontaminated locations may model a relatively uncomplicated method to monitor the success of environmental remediation projects.

This is not only the first report of mandibular agenesis in snakes, but also the first report of merolepidosis seemingly resulting from exposure to toxic wastes in any snake.

The occasional occurrence of divided ventrals, and regular retention of divided anals (normally single in *Thamnophis) in* merolepid snakes in general, and in the amandibular one here reported, suggest that developmentally a divided anal is plesiomorphic (primitive), and an entire anal apomorphic (derived). Because the ventral scales of normal cenophidians are paired embryonically (Bechtel, 1995: 94), and fuse late in development, the divided anal and retention of paired ventrals in neonate merolepids and other anomalous individuals suggests that those conditions are a product of arrested development. The quadripartite ventrals in some merolepids (Smith et al., 2000) suggests that they may be a retention of even earlier stages of embryogenesis.

Acknowledgments

We are much indebted to Dr. William E. Friedman of the University of Colorado for the photograph of the amandibular snake described under No. 1 above; to Dr. Kym Campbell for much help with the literature, including copies of her review of knowledge of the effects of pollution on snakes and lizards; to Dr. Arthur Hulse and Owen Lockhart for the gift to UCM of the two neonates described in No. 2 above; to Dr. William A. Hopkins for guidance to and provision of pertinent literature; to Dr. Louis Guillette for his counsel relative to pollution effects; to Dr. Lauren Livo for help with the literature; and to the authorities of the University of Colorado Museum and Department of EPO Biology for space and facilities.

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HerPET-POURRI

by Ellin Beltz

Thanks to everyone for their patience for the past 60 days. As promised two months ago, here's what's been happening. We found out in March 2001 that we were moving to open a new TAMS office in Ferndale, California. The town is quite interesting. It is the only small town in America with the whole downtown and parts of the residential districts on the National Historic Register. You may have seen it used as a background in several films including "Outbreak" with Dustin Hoffman, and the upcoming release "Majestic" with Jim Carrey. The surrounding area has mountains, beaches, big coastal redwood trees, bunches of salamanders, yellow-legged frogs, Pacific tree frogs, hummingbirds and cows. It is the dairy capital of the Lost Coast. It also has more earthquakes than most other areas of the U.S. because it lies nearly on top of the Cape Mendocino triple junction where the San Andreas Fault curves offshore and becomes the edge of the descending Juan de Fuca Plate. The melting of the JdF provides the magma for Cascade Mountain formation including Mt. Shasta, Mt. Hood, Mt. Rainier and Mt. St. Helens.

In mid-March, Ken went to Ferndale to buy a house—and did. I didn't see the house because at that point, I was in the midst of semester and couldn't take any time because spring break at my two schools didn't overlap. So Ken found a 1902 Victorian with a 1989 addition. Both parts survived the "big one of 1992." This large earthquake shifted several local houses off their foundations—the local solution is to jack them up and push them back on! All the buildings, even the elaborate multi-story Main Street confections, are wood. Bricks would just all fly different directions—most chimneys have collapsed at one time or another and been replaced with sheet metal stacks.

I started sorting out my stuff in the minutes left to me around teaching at Northeastern Illinois University and Trinity Christian College ("real science for real Christians"). I recycled a blue bag of paper shreds every day for two weeks. Goodbye old papers, ex-husband, Chicago local school council, and local neighborhood committees! I was really glad that last year when I was deathly ill I had sorted out all my stuff (so no one would "find" it after I was gone). That surely made this year's task much easier!

Meanwhile, our friend Jon Meyers from Eugene, Oregon, was helping us out. Let me say that without Jon, Marco Mendez, Teri Radke and Lori Daniels I would have never finished on time.

You may recognize Marco's name—he's the handsome young man who is on the board of Project Exploration and who has volunteered at three ReptileFests so far. Marco will also be hunting dinosaurs in Wyoming while you are reading this—but more about that later!

By May, the move was becoming very real. I had finals for two weeks (that non-synchronous schedule again), then I got to serious packing. Ken packed his books in 25 boxes too heavy for me to lift. I thought that was excessive until I packed mine in another 25 identical boxes! We also gave away 10 boxes to friends and students and Helen Shaw took another 10 boxes to the Newberry for their book sale. Fear not, no herp books went in those piles! Mike Dloogatch came and took away our complete set of CHS stuff—so if you're looking for old things now, you need to contact him <MadAdder0@aol.com>.

Ken left to close on the house on the 23rd of May but it turned

out that the previous occupants couldn't get out until 29 May—so he stayed in a tent in the redwoods (or by the beach) for nearly a week while Jon and I tried to finish up Clybourn. The previous week I had sent an email to everyone for whom I had an address, telling them that I would not renew my contracts at NEIU or TCC (hallelulia, I'm a bum!) and giving my new address in California. Boy was I ever surprised at one response! Paul Sereno wrote me from Mongolia and asked me to join him in the field this summer! I stopped worrying about packing or fussing about the move because I looked at a calendar and realized how crazy my next 60 days had become.

Marco stayed over and was a marvelous assistant to Jon for most of the last weekend. Gabe Lyon came over for preplanning on the last day we had any furniture. She was just back from Mongolia, so I don't think the lack of civilized amenities meant much—but we tried to normalize as much as we could and made some cookies and a table to work on. Worse luck for me, all my dinosaur and geology books were packed, so I couldn't do background on the area except from memory.

We decided to fly into Rapid City, South Dakota, as the closest airport to the dig site. At this point she told me they thought they had a *Tyrannosaurus* in the ground! She also told me there were some folks from a non-research museum who were trying to "muscle in" on the dig site and that we'd have to be careful in the field. Much of the area is Bureau of Land Management (BLM) controlled. You thought reptile laws were bad, you should see BLM land regulations for dinosaurs and other vertebrate fossils. Remember that Peter Larsen of the Black Hills Institute in Hill City, South Dakota, went to Federal prison for two years for the "crime" of digging up "Sue" for which the Field Museum later paid $7.9 million to the actual land owner. The U.S. got not one thin dime for all the taxpayer legal expenses, not to mention housing and feeding Peter for two years.

She told me that we must tread lightly in dinosaur land. You must not pick up anything vertebrate without a permit. Getting a permit requires a field study by BLM personnel—including an archaeological report since the area was utilized by Native Americans long after the dinosaurs roamed the earth. No artifacts or bones may be moved or touched without risk of a Larsen-like experience.

May 28 may have been Memorial Day to the rest of the world—to me it was "last chance to pack" day. Teri and Lori require special thanks for packing up my woodshop and tools on the last day. I just couldn't. I was just flattened by staying up to 3 A.M. every day and getting up at 6, packing, packing and more packing. That night, I got two hours of sleep and the movers showed up. If you ever have to move—call Reebie Movers and ask to be scheduled for "Tony." Tony and Reebie are the folks who moved "Sue" to and from Sotheby's for the auction. They moved my stuff so carefully that one month later we have yet to find anything broken—even deep down in the boxes. Better than that, they were on time on both ends, courteous, friendly and aware that moving is one the most traumatic things that a person can live through.

That was also the day that we closed on the house. I received 32 phone calls that day, several from Ken in California telling me detail-by-detail what was going on. Jon's friend Sheri Janowski came over that day and brought us great coffee and moral support.

We moved over 600 separate items from Chicago to Ferndale. I never realized how much space or weight my stuff was (for the curious, we weigh 28,000 pounds and occupy a 48-foot truck with all the furniture disassembled). Tony said the usual density for a 48-foot truck is much less. I suspect my rocks and metal antiques, my ebony sideboard and a few other things probably contributed!

The truck left Chicago on May 29 at 4:00 P.M. Jon and I had dinner at Whole Foods for the last time and got on the road. That night we were in Davenport, Iowa. The next night in Kearney, Nebraska; then backside o' beyond, Utah. We arrived in Ferndale at 2:00 A.M. on Saturday morning having been on the road, or asleep, for 82 hours. My stuff arrived as promised Wednesday, June 6. Then, on June 7, I left (via four takeoffs and landings) for Rapid City, South Dakota to join Gabe for a pre-field camp expedition to Zerbst Ranch.

The weather delayed us both, but we got together around midnight in the airport at Rapid City, then took a downtown tour looking for food and a hotel. The next day we hopped back in the rentacar, popped in a CD and left the Black Hills for dinosaur land. We passed through Hill City (at 35 mph) and then south along a gorgeous 2-lane blacktop to the turnoff for Zerbst Ranch. We saw antelope and deer, jackrabbits and a badger, tons of birds and no people from when we left Newcastle for the last part of the trip. Turning off the blacktop, we drove the last 25 miles on the gravel entry road, through a river, to the ranch. We were met by Arlene Zerbst and shown into their lodge. Holy cow, what a palace! There's a huge dormitory, a big living room, two long tables and the biggest kitchen I've ever seen in a house. Arlene can cook for the multitudes and does. Her opening of PaleoPark had 90 people at a sitdown lunch. She is the president of the Wyoming Homemakers and takes immense pride in running her ranch, her oil wells, her fossils and her kitchen like a well-oiled machine. And I used to think I got a lot done in a day.

She drove us to the dinosaur trackways her late husband, Leonard, had exposed with a backhoe years before. There were three-toed tracks and rather roundish tracks and what may be skin impressions where some dinosaur rolled around in the mud millions of years ago. Two weird marks may be the neck and horn impressions of one of the big frilled *Triceratops* so commonly found on this ranch.

All this time, the name "Zerbst" was ringing bells in my brain, but I couldn't remember where I had seen it before. Then Arlene took us to see the *T. rex*. Talk about starting at the top. This "king of the tyrant lizards" was the first dinosaur I had ever seen in the ground! Then it was back to the lodge where we met up with Arlene and Leonard's daughter, Kristen now Stauffer (and expecting the first little Stauffer). Kris took us back in the field and we went to their "microsite" where little, tiny pieces of Cretaceous flora and fauna are weathering out of a hillside in glorious profusion.

While we're driving around, the ladies are explaining to us how they want to make PaleoPark a summer destination for all sorts of tourists. So far they've had elder care groups and other individuals come through. They show them the footprints and drive them around to see the in situ dinosaur with skin and some of the other interesting things. People can also stay over—rather like a bed and breakfast with dinosaurs. For more details, visit their website <http://www.paleopark.com> or call Arlene at (307) 334-2270.

And still the name "Zerbst" nagged at my memory. We went back to the lodge for the first of Arlene's superb meals and I was reading around their posters and pictures when I came to a reprint of a news article that said how this was the ranch from which a *Triceratops* with skin was removed under Leonard's direction. They nicknamed this beastie "Kelsey" after their first grandchild. Something in that article made it go "click." Way back at the beginning of the 20th century, the American Museum in New York excavated a duckbill with skin—it was on display in a glass case there when I was child and it was labeled "Zerbst Ranch." So here was a connection with my many childhood hours spent staring at the dinosaurs there—the unusual name stuck—and now here I was in the same place and ready to dig dinosaurs myself.

After supper, Kris and I went to play with their website, then Arlene shouted for us to get off the phone, the lightning storm had ignited part of the range and it was all hands on deck for fire detail. Kris' husband Chad and she hopped into their pickup; Gabe, Arlene and I squeezed into another and we went off in search of the fire. Fortunately, the rain extinguished it before we got there, but it was an exciting ride on the ridgetops. The lightning flashes illuminated the range and made you see details in a way that sunlight never can.

Saturday, June 9, was the annual shindig at the Black Hills Institute <http://www.bhigr.com>. We went as the Zerbst's guests and met both Peter and Neil Larsen, many of the other ranchers in the dinosaur range and later, Bob Bakker (author of *Dinosaur Heresies*). There was an auction of all sorts of rocks and minerals, dinosaur shirts, books and stuff and a flea market of unusual, non-dinosaur stuff. I fell in love with a taxidermy mount of an antelope head, but decided not to get it as I could not imagine how I could get it from Wyoming to Ferndale without wrecking its elegant eyelashes. Not to mention it's a weird shape and, while not heavy, cumbersome.

During the auction, one of the items was a gift certificate from Dairy Queen. Gabe bid a dollar on it and got it—and the antelope head was included! Oh dear, now I had to figure out how to get it home. The Zerbsts were all quite amused; they put it in their SUV chuckling all the way. I do wonder if they "fixed" that somehow. A huge thunderstorm blew into town; the wind went sideways and the rain came down in buckets, but by dinner time, it was just a drizzle.

At the dinner, Arlene and Leonard were honored for their contributions to local paleontology; Leonard was remembered by the Larsens and, in a speech which left few eyes dry, by Arlene. Then it was time for the two-and-a-half-hour drive back in the dark. For you Chicagoans, that's 2½ hours of driving at 65 mph and no stoplights the whole way!

The next morning we visited Stan and Claudia Swanson's buffalo ranch just to the south of Zerbst Ranch. Stan gave us a tour of the buffalo; first the yearlings, then the moms and calves. I've never been this close to buffalo before. And we were feeding them "cow cake," so they were quite, quite close. These giant creatures are really very interesting. They graze and walk, so that their land is not depleted like cow land. They don't walk the fence lines like cows, rather they spread out and graze more evenly. And they're smart. Several know how to pull the chain on the cow cake feeding machine to dispense the goodies! So the result is protein for people and nice land for the next generation. The Swansons harvest the animals and process beef jerky. You can reach with them at <luswan@coffey.com> or call Stan at (307) 334-3142 for more information about getting some of this wonderful stuff for your next camping trip or expedition. Realize that everyone in dinosaur land is self-employed—and the economic boom hasn't quite reached out this far, so everything that city folk can do to help support these folks will keep the land private and individual—not BLM or corporate.

When we got back to the lodge, we were joined by the Ph.D. and two helpers from that non-research museum we'd been warned about! Personally, I think they're poachers—they don't seem to have done any work on their own—they just want to take out what everybody else has found. So these cheeky folks sat there and tried to quiz Gabe on where, what and etc. They got zippo—I don't really understand how they expected much. They left and later a call came in from another rancher who was all hot under the saddle because they'd been on his land without asking. So it's not just an isolated incident, but a pattern.

That night we found two lovely Great Basin toads under the lights, catching bugs. Wow, what tongues they have! The next day, we left the ranch and drove up to Newcastle for a meeting with the BLM. Surprise, there were the museum folks, too. One of them even asked for permission to excavate the creature that is on our list of things to do when we get back (under permit from BLM, of course).

Gabe and I visited a cave and she went to the airport. My antelope head and I went to U-Haul where it got wrapped in a whole box of bubble wrap and a wardrobe box. After a horrible night's sleep listening to the local kiddie-thumping car scene cruising up and down under the windows of all five of Rapid City's motels, I took my head to the post office and sent it "Priority Mail" to myself. I really did not think it would make it to Ferndale in one perfect piece. But they promised two-day delivery and said it would be in good shape, so in it went. I went to the Museum of Geology at the South Dakota School of Mines and Technology <http://www.sdsmt.edu>, which has an interesting old-style exhibit hall with minerals labeled by name but not by formula and a rather broken tailed dinosaur erect at the end of the hall. They also had a *Triceratops* skull in matrix and a "sea lizard" cast hanging in the middle. The adjunct exhibit "Dinosaurs of Russia" was the same we had seen at DinoFest in Chicago, but the kiddie museum had some interesting hands on features and both would be

worth a trip if you're ever in Rapid City. Incidentally, don't stay in Rapid; drive down the road and stay out of town. The muscle car scene is quite out of control and for $75 a night; I prefer sleep to pounding stereos, peeling tires and profanity.

I went back to the airport for my three flights home (the Arcata to Redding stop was omitted). They were uneventful, but if you ever come to visit, fly through Portland, not San Francisco. The former is a nice relatively uncrowded airport. In SF, you have to fight with crazed urban yuppies and then they put you on a shuttle to a hot, airless, bathroom-free remote terminal to wait for your "commuter plane."

Flying north over the clear cuts and the Humboldt Redwoods State Park really sharpened my perspective on clearcuts and logging up here. Only about 4 percent old growth forest is left and there is a company that bought out Pacific Lumber and which is attempting to rapidly cut down all the rest of it to balance their profit and loss sheet. Their cuts are ugly; the hillsides are eroding into the streams. There are protestors, young kids from all over who hang in the forest and interfere with the logging operations. The loggers feel that it is ok for them to harass, physically or mentally, any kids they find. I have even heard of rapes and torture—from the mouth of a logger—not from a protestor. I asked this logger if he was a Christian. He said he was and which church he attends. I asked him then how he could be a Christian and do unto others what he had described doing to these children. He had no answer for me.

So, friends, it's been a long, strange month. Jon and I drove 3300 miles from Chicago to California; then I turned around and flew halfway back and back again. Seven thousand miles in three weeks and everything you own in boxes can be a pain. I never realized how much I need a stable home environment before. Perhaps that is why I hadn't moved for 21 years!

So, I want to particularly thank Wes and Kim von Papineau, Marty Marcus, Ernie Liner, Ray Boldt, Ted and Sue Brown, Alan Rigerman, J. N. Stuart and Ms. G. E. Chow for clippings which I will use for next month's column. Send whole pages from newspapers and magazines to: Ellin Beltz, P.O. Box 934, Ferndale, CA 95536-0934. Also a big thank you to CHS Vice-President Lori King for some lovely housewarming frogs and to the USPS for getting my antelope home with all eyelashes intact. And thanks to Paul and Gabe for including me in their Wyoming Field Camp, to Arlene, Kris and Chad for a wonderful trip to their ranch, to Jon, Marco, Teri and Lori (packers extraordinaire) and to anyone I've forgotten who has helped clip, pack, move, unpack or ??? in the past couple of months. You're not unappreciated, I'm just a space with about 100 boxes to go.

Unofficial Minutes of the CHS Board Meeting, June 15, 2001

The meeting was called to order at 7:51 P.M. Board members Dan Bavirsha, Rich Crowley, Char Haguewood, Lori King and Linda Malawy were absent.

Officers' Reports

Recording Secretary: Emily Forcade distributed and read the minutes of the May board meeting. Corrections were made and the minutes were accepted.

Treasurer: Greg Brim distributed the treasurer's report for May 2001. The Toledo Zoo field trip lost money. Some ideas were discussed about how to increase attendance and reduce money lost. Increasing the price and the publicity were mentioned. The price increase could discourage attendance of families with children. Gary Fogel said that he would volunteer to handle the publicity of the next field trip when someone volunteers to organize one. Mike Dloogatch said that the trip was great. Roger Conant designed the striking reptile house which was built as part of the federal jobs program created by Franklin Roosevelt. An enclosed habitat for local salamanders was an unusual and interesting feature. Several tuataras were on exhibit. There was plenty of off exhibit space with a rich collection. A walk-through exhibit of the local frogs along with their recorded sounds reflected Toledo's history as a city (nicknamed "Frogtown") built on an area with a large number of amphibians.

Membership Secretary: Mike Dloogatch distributed the membership report. The membership is 810. There was some discussion about the membership numbers, society income and general meeting attendance. Jack said that we have a general meeting attendance that averages 70. Compared to our past attendance, before *Reptiles* magazine and swap meets, it is less but compared to other nonprofit organizations the decline in our membership numbers isn't pronounced.

Vice-President: Jack reported for Lori King. The June general meeting is Show and Tell. Steve Spitzer volunteered to coordinate the presenters, unless Lori would prefer to do this.

Corresponding Secretary: Steve Spitzer reported that our annual insurance premium has increased from $979 to $1133.

Publications Secretary: Mike Redmer is talking to Chris Lechowicz about updating the website. Chris will include material he receives but he can't provide all of the content. Mike mentioned that Chris is having formatting problems related to the available software. Greg Brim said he would talk to Chris about his software requirements. He may be able to provide them.

Standing Committees

Grants: Mike Dloogatch received several thank-you letters from grant recipients. Mike Redmer said that a graduate student returned an award because he is not able to pursue the planned project. One of the 1997 grant recipients will be contributing an article or a general meeting presentation. Mike

Redmer suggested that grants be awarded earlier in the year, when recipients are actually working in the field. He made a motion that we allocate $2500 toward grants next year. Steve Spitzer seconded the motion. Greg Brim raised the question of why we allocate money for grants. Jack said that regarding our IRS status, grants validate our role in conservation. Mike Dloogatch said it speaks to our fulfilling a certain mission. Mike Redmer said that there is other grant money available from organizations as matching funds. If we could increase the amount of our awards, we would then increase the number of grant proposals. After this discussion, the motion was carried by a unanimous vote.

Shows: Jack said that the Chicago Academy of Sciences has asked that we do a members' brunch show on October 21, 2001. He informed them, with our apologies, of the Midwest Herpetological Symposium that weekend. Jenny said that the Rockford Pet Expo has offered us booth space at their non-profit organization rate of $100 plus a $42 electrical fee. Sally is willing to do the show but more volunteers are needed to make it work. It will be held the weekend after the symposium. There was not much enthusiasm for the show due to Rockford's distance.

Raffle: Jim Hoffman expressed an interest in getting involved with the society, perhaps as part of the raffle. He wanted to know what it involved. Jack said that the raffle has been part of the society since the beginning. When Marcia Rybak was president, she made an aggressive effort to solicit products companies. These companies have continued to donate items. Some contributions come from members. Jack can also provide items if Gary Kostka is short on any particular night. He said the real problem is the storage of items, bringing them to the meeting and arranging for a contingency plan if you can't come to the meeting. Jim wants to speak with Gary about the raffle. Gary Fogel also offered to help.

Ad Hoc Committees

Symposium 2001: Jack said that Char Haguewood has resigned as chair due to other obligations. She will continue to work on brochures and liaise with the hotel. Jack will act as a coordinator until another chairperson is found. He will contact Joan about the breeders' sale. Jenny said she believed that the breeders' sale was important for several reasons. It draws the public. Many people would attend such sales weekly if they were available. The sale provides an incentive for people to attend the meeting that they might not do if they saw it as a trip to Chicago for only a day. The breeders' show the week before the symposium is providing us free space to advertise the symposium, including the breeders' sale. Mike Dloogatch said we need to resolve this issue by the June 27 general meeting because we need to send flyers in the July *Bulletin*. The next meeting for the symposium planning committee will be on July 8 at 2 P.M. at Mike Dloogatch's office.

Meeting facility: We have the same room available through September. In October, the auditorium will begin to house a big cats exhibit. The second floor meeting room will then be set up for AV equipment. It should be suitable as a room for our general meetings.

Nominating Committee: We still don't have enough non-board members or a chair. Any current board members interested in running again are invited to let a committee member know.

Trips: Jack thanked Char for putting together a spectacular trip. A video of the trip was made and may be exhibited at a library.

Salamander Safari: Steve Spitzer made the necessary corrections to the letter to the Superintendent of Conservation for the Forest Preserve District of Cook County and sent it.

Public Relations: Jack will be sending press releases. Steve Spitzer will be putting up flyers at PetSmarts on the north side.

Picnic: Ron Humbert said that Linda Malawy offered to host a yard party. The group thought this was a fine idea. Linda will be back in July and plans can proceed then.

Old Business

Frog Call Tapes: The Habitat Project sent three CDs and three audiotapes of the frog calls to Mike Redmer. We can't make copies and we can't sell them for profit. Mike suggested we raffle two at each meeting.

Retreat: The CHS planning retreat will be held on June 16 from 9:30 A.M. to 4 P.M. at the Grove in Glenview.

Shirts: Sample polo shirts were displayed. We can have as many as three colors, but we need a minimum order. Those present at the board meeting placed orders. The shirts will be displayed at the next general meeting.

New Business

Ellin Beltz has donated a full set of CHS *Bulletin*s. Jack said we could think about options for what to do with them. We can for example consider getting them bound and placed in a library, or putting them on our website.

Jack received a letter from a 15-year-old who would like to be involved helping with reptiles during the summer. Jack will invite him to the general meeting.

Round Table

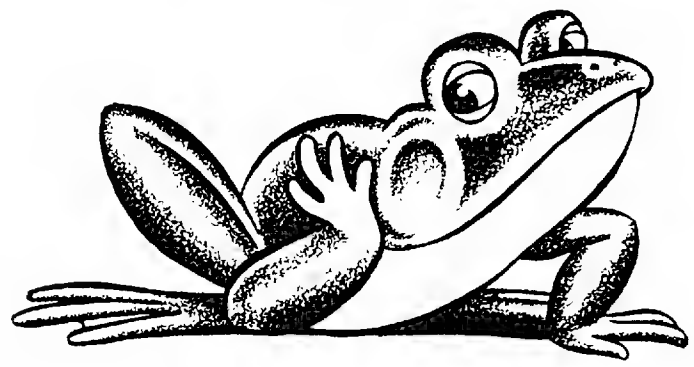
Greg Brim said he would be out of town the last week of June and the last three weeks of July. Mike Dloogatch can pay bills if necessary and deposit checks while he's away.

The meeting adjourned at 9:23 P.M.

Respectfully submitted by Recording Secretary Emily Forcade

The Tympanum

The letter below, having been approved by the Board of Directors of the Chicago Herpetological Society, was mailed on June 12, 2001.



Mr. Chris Merenowicz
Superintendent of Conservation
Forest Preserve District of Cook County
536 N Harlem Avenue
River Forest IL 60305

Dear Mr. Merenowicz:

The Board of Directors of The Chicago Herpetological Society (CHS) would like to discuss the events surrounding our 2001 Salamander Walk.

Our Society has had an annual Spring Salamander Walk in the Cook County Forest Preserve for the last fifteen years. In the early years this event was informally attended by less then 25 individuals, so the CHS did not apply for a permit. As the event has become more popular in recent years, the chairperson of the event has applied for a permit. As in past years, the plan was that outing participants would first meet at a nature center for an educational lecture on local species and be informed of their ethical responsibilities as forest preserve visitors. This event has, for many Cook County and other area residents, been their first exposure to local amphibians, and our society takes seriously our mission of educating all who attend.

This year, our salamander outing chairperson, Ron Humbert, discussed our planned event and the use of Camp Sagawau with naturalist Mike Konrath, and then applied for a permit on March 12, well in advance of our March 31 event date. Several days before the event (no permit having been issued) Ron contacted your staff to inquire as to the status of the permit. After several calls he was informed by Wayne Vanderploeg that there was a possibility our event might be denied due to concerns over a massive die-off of tiger salamanders (*Ambystoma tigrinum*) in some of the ponds the club normally visits. After some discussion, Ron was informed our group could still meet at Camp Sagawau, but that our field activities would be restricted to the vicinity of Bullfrog Lake due to concerns about disease transmission between salamander ponds.

Although the Society is supportive of your efforts to ensure the health of your amphibians, we are disappointed that our trip was nearly canceled and then restricted to one area on such short notice.

It is our understanding that your staff has initiated investigations into the cause or causes of this spring's tiger salamander mortality. Since amphibian/reptile conservation is a goal of our organization, we respectfully request that you or your staff keep us informed of the results of these investigations. Also, if there is anything we can do to help your department with these investigations, please let us know.

Our Society is based in Cook County and would like to be able to continue to have a positive relationship with the Forest Preserve District. To that end, we would like to schedule a meeting between yourself and several members of our society to discuss our mutual goals of conservation and education. I can be contacted . . . days, or . . . evenings and weekends to discuss a meeting, or you can write me at the address on our letterhead or at my home address.

Also, please find attached a list of animals observed during this year's outing.

Sincerely, Steve Spitzer, Corresponding Secretary

Reptiles and Amphibians from 3/31/2001 Field Trip

Blue-spotted/polyploid salamanders (*Ambystoma laterale*/*Ambystoma* hybrid complex)	30
Central Newt (eft stage) (*Notophthalmus viridescens*)	5
Common Garter Snake (*Thamnophis sirtalis*)	11
DeKay's/Brown Snake (*Storeria dekayi*)	1

Herpetology 2001

In this column the editorial staff presents short abstracts of herpetological articles we have found of interest. This is not an attempt to summarize all of the research papers being published; it is an attempt to increase the reader's awareness of what herpetologists have been doing and publishing. The editor assumes full responsibility for any errors or misleading statements.

TRANSLOCATED CARIBBEAN IGUANAS

C. R. Knapp [2001, J. Herpetology 35(2):239-248] performed a cross-sectional population biology study on a translocated Allen's Cay iguana (*Cyclura cychlura inornata*) colony 10 years postintroduction. Between 1988 and 1990, eight iguanas (4♂, 4♀) were translocated to 1.8-ha Alligator Cay in the Exuma Island chain, Bahamas. Of the original eight translocated iguanas, seven were recaptured. Twenty-eight descendants were captured; 39% male, 57% female, and 4% juveniles. An estimated minimum population size of 62 individuals was calculated using a revised Petersen mark-and-recapture method and flush transect data. Nine descendant age classes were represented in the capture data or via visual observation. Descendant iguanas demonstrated a significantly higher average annual growth rate for both males and females (35.3 and 30.1 mm, respectively) than iguanas from the founder population (17.6 and 11.4 mm, respectively). The two most observed plants (34.8%) in scat samples included the leaves, buds, and stems of *Rhachicallis americana* and *Suriana maritima*. *Rhachicallis* was more prevalent (19.8%) than *Suriana* (15.0%) in scat samples. However, *Rhachicallis* was more abundant on the island and the Electivity Index indicates that it was a slightly less preferred food item than *Suriana* (-0.02 and 0.50, respectively). Alligator Cay possesses numerous vegetative and topographic characteristics, which are ideal for iguana habitation and population growth, and contributed to the successful translocation. The author concludes that conservation initiatives involving translocation programs should be considered a sagacious method if proper precautions are undertaken prior to iguana release.

TADPOLE DISTRIBUTION AND SURVIVAL

S. Thurnheer and H.-U. Reyer [2001, Amphibia– Reptilia 22(1):21-32] note that predictions about population and community dynamics are usually based on lab experiments. Because such results are difficult to transfer to natural conditions, the major purpose of their study was to test the effects of biotic and abiotic factors on tadpole populations in a natural environment. The authors stocked six ponds, created the previous year, with known numbers of *Rana esculenta* and *R. lessonae* tadpoles and followed their development over several months. When compared among ponds, tadpole density correlated positively with the nitrate:phosphate ratio. This suggests that water chemistry may have affected survival, either directly or indirectly via productivity. Within ponds, both species showed a clear preference for the shallow zone. This behavior probably reflects a preference for warm water close to the surface, rather than avoidance of predators, because relative densities of odonates also increased from deep to shallow zones. This study is one of few that not only considers the distribution of the anuran tadpoles but the distribution of their predators as well.

BREEDING MADAGASCAN SIDENECKS

G. Kuchling [2000, Dodo 36:62-74] reports that Ankarafantsika is the only protected area in Madagascar with good habitat for the endangered, endemic freshwater turtle, *Erymnochelys madagascariensis*, but due to exploitation many populations are already depleted. A conservation strategy for the species at Ankarafantsika was developed in 1997 and includes a captive breeding and rearing operation to produce juvenile turtles for reintroduction and population augmentation. A facility comprising 22 spacious concrete ponds and a laboratory was built in Ampijoroa and is operated by Durrell Wildlife Conservation Trust. A motor pump is used to fill the ponds with water from a nearby lake and all ponds have a drainage system. Ponds are designed differently for hatchlings, juveniles, adult females and males. Females have access to beach areas where eggs will be incubated naturally. The facility can hold at least six adult females and males and provides for at least 200 hatchlings to be raised for two to three years.

REDISCOVERING *RANA ONCA*

J. R. Jaeger et al. [2001, Copeia (2):339-354] studied remnant populations of leopard frogs within the Virgin River drainage and adjacent portions of the Colorado River (Black Canyon) in northwestern Arizona and southern Nevada. These populations either represent the reportedly extinct taxon *Rana onca* or northern, disjunct *Rana yavapaiensis*. To determine the evolutionary distinctiveness of these leopard frogs, the authors evaluated mitochondrial DNA (mtDNA) restriction site variation (RFLP), mtDNA control region sequences, randomly amplified polymorphic DNA (RAPD) markers, and morphological characters. Individuals from the Virgin River drainage and Black Canyon represented a single RFLP haplotype and were identical for nucleotides along a portion of control region sequence. Evaluations of RAPD data demonstrated high levels of similarity among individuals and populations from this region. Leopard frogs from the Virgin River drainage and Black Canyon differed from *R. yavapaiensis* from west-central Arizona and northern Mexico in maximum parsimony and distance analyses of RFLP and control region sequence data and in maximum-likelihood analysis of the sequence data. Multidimensional scaling of RAPD data provided a similar and congruent indication of this separation. Analysis of principal component scores demonstrated significant morphological differentiation between leopard frog specimens from the Virgin River drainage and *R. yavapaiensis*. Parallel patterns of divergence observed in the mtDNA, RAPD, and morphological analyses indicate that leopard frogs from the Virgin River drainage and adjacent portions of the Colorado River are phylogenetically distinct. The authors conclude that these leopard frogs should be recognized as a lineage separate from southern populations of *R. yavapaiensis* and classified as the species *R. onca*.

Advertisements

For sale: Frozen rodents now available at the General Meeting! Just another good reason to come to the meetings at the Chicago Academy of Sciences Patty Notebaert Nature Museum. Assorted sizes of rats and mice. Call Rich Crowley at (708) 485-5705 for details and pricing.

For sale: rats and mice—pinkies, fuzzies and adults. Quantity discounts. Please send a SASE for pricelist or call Bill Brant, *THE GOURMET RODENT*, 6115 SW 137th Avenue, Archer FL 32618, (352) 495-9024, E-mail: GrmtRodent@aol.com.

For sale: murine-pathogen-free rats and mice available in all sizes, live or frozen: pinkies, fuzzies, crawlers, small, medium and large. Frozen crawler mice in lots of 2000, $.17 each. Also available, full grown hairless mice. FOB shipping point. Master Card accepted. Call (518) 537-2000 between 8:00 A.M. and 5:00 P.M. or write SAS Corporation, 273 Hover Avenue, Germantown NY 12526 for prices and additional information.

For sale: from **The Mouse Factory**, producing superior quality, frozen feeder mice and rats. We feed our colony a nutrtionally balanced diet of rodent chow, formulated especially for us, and four types of natural whole grains and seeds. Mice starting from: pinks, $.17 each; fuzzies, $.24 each; hoppers, $.30 each; weanling, $.42; adult, $.48. Rats: starting with pinks at $.45 each, to XL at $1.80 each. Discount prices available. We accept Visa, MC, Discover or money orders. P.O. Box 85, Alpine TX 79831. Call us **toll-free** at (800) 720-0076 or visit our website: http://www.themousefactory.com.

For sale: from Bayou Rodents, excellent quality feeder mice and rats. Every size available. Pinks starting at $20/100. Orders are shipped by overnight service Monday thru Thursday. We accept Visa, MasterCard and Discover. For more info, contact Rhonda or Peggy, (800) 722-6102.

For sale: **high quality frozen feeders**. Over a decade of production and supply. Seven sizes of mice availabe: small newborn pinks up to jumbo adults. Prices start at $25 per 100. Feeders are separate in the resealable bag, not frozen together. Low shipping rates. Free price list. Kelly Haller, 4236 SE 25th Street, Topeka KS 66605, (913) 234-3358 evenings and weekends.

For sale: baby bullsnakes, c.b. '01, $15; baby western fox snakes, c.b. '01, $15; baby Madagascar giant hissing cockroaches, great pets or food for herps, very interesting to keep, $1 each, easy to raise and breed; baby ball pythons, c.b. '01, well started, great pets, $20, juvies, $30, caresheet available; adult female albino prairie kingsnake, never bred!, $35; adult male boa, 8', super docile, excellent breeder, FREE to good home only; young male albino Burm, 8', FREE to good home only; large/jumbo sized frozen rats, raised in the finest state of the art facility of its kind, only $2.75/ea., limited quantities; feeder quail, give your herp some variety, USDA grade, adults, great as a supplemental food for monitors, crocs, big snappers, etc., $1.50 ea., must pick up or can deliver to CHS meetings, all proceeds will be donated to the Wildlife Discovery Center to continue its educational efforts. Rob Carmichael, The Wildlife Discovery Center, City of Lake Forest, 400 Hastings Road, Lake Forest, IL 60045, (847) 615-4388.

For sale: herp books. *Amphibians and Reptiles of the Grand Canyon* by Miller, Young, Gatlin, and Richardson, 1982, 143 pp., 47 b & w plates, $45; *The Hellbenders* by Max Nickerson and Charles Mays, 1973, 106 pp., 26 figs., $30; *Snakes of South America* by Dr. Marcos Freiberg, 1982, 189 pp., many b & w and color photos, keys to genera, inscribed by author, plastic covers, $30; The Snakes of Ecuador: A Checklist and Key by James A. Peters, 1960, pp. 491-541, $20; *Reptiles and Amphibians of Minnesota* by W. J. Breckenridge, 1944 (first ed.), 202 pp., b & w photos, drawings, range maps, no DJ, hardbound, $45; *Guide to the Snakes and Lizards of Wisconsin* by Wesley E. Dickinson, 1949, 70 pp., 6 figs., 11 color plates, $25; *The Amphibians and Reptiles of Nebraska* by George Hudson, 1942 (first ed.), 146 pp., 20 b & w plates, $35; *The Amphibians and Reptiles of North Dakota* by George and Jeanette Wheeler, 1966, 146 pp., 20 b & w plates, $15. All books softbound except as noted and in excellent condition. Prices postpaid for orders $25 or more, $2.50 for under $25. Send SASE for complete list. William R. Turner, 6838 S. Ivy Street, Apt. 302, Englewood CO 80112, (720) 493-9378. E-mail: turnerbmrk@prodigy.net.

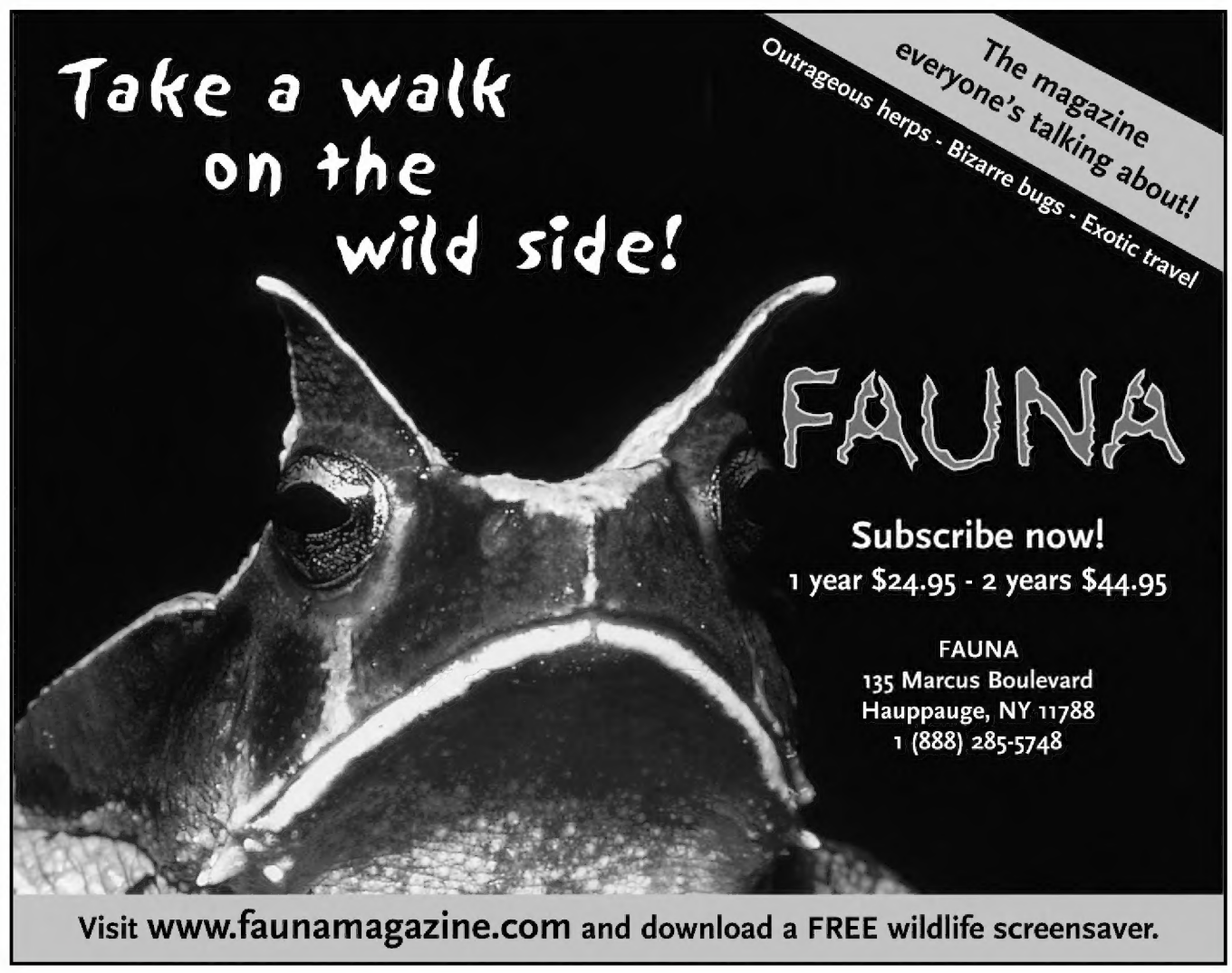
For sale: Surinam red-tails, veterinarian owned, unproven breeding pair, female c.b. '95, male c.b. '92, $800 o.b.o. for both. Frozen rats and cages also available. Julie Keen, (262) 877-3819. E-mail: Dkeen@busynet.net. [WI]

For sale: group of African fat-tails, c.b. 4/00, one male and one female orange, one male and one female orange stripe, one female peach phase, one female khaki phase, excellent condition, group of 6, $500. Mike Wood, 1025 Shady Lane, Warsaw IN 46580, (219) 269-7664

For sale: **Now taking reservations for c.b. 2001 aberrant garter snake offspring**. Following are expected to be produced this year: **Easterns**—Blais Flames (speckled, $125 each, red & orange phase, $50-$125 each, peach phase, $50 each); anerythristics, $175 each; hets, $50 each; Florida blues (not *similis*), $10–50 each; melanistic, $35 each; erythristic (2 strains): erythristic × Blais flame & erythristic × melanistic, $50–100 each. **Plains**—Snows (2 strains), $375 each; hets, $175 each; red-albino (double hets), $150 each; albinos (2 strains), $125 each – hets, $50 each; anerythristics, $100 each – hets, $50 each; possible het plains (66% chance of being het for albino, anerythristic or snow), $35 each; normals, $25 each/2 for $40. **Red-sideds**—anerythristi, $100 each (hets $50 each & possible hets $35 each); normals, $25 each/2 for $40. **Wandering**—het albinos, $75 each; normals, $25 each/2 for $40, & more. Babies will be available starting in June, call for availability, (919) 934-0110. E-mail: Sirtaliso1@aol.com Website: http://www.thamnophis.com/features/ScottFelzer. [NC]

For sale: 2001 potential offspring; we have eggs or gravid females for the following species—hi-orange western womas; pastel hypo pyros; yellow anacondas; Argentine boas; Dumeril's boas; Brazilian rainbow boas; Amazon tree boas; apricot Pueblan milks. Babies due April through August. Call or E-mail for prices and availablity. Mark Petros, Strictly Serpents, (847) 854-3259, E-mail: MLPserpents@hotmail.com.

For sale: Send SASE to CRC, P.O. Box 0731, Las Vegas NV 89125-0731 for brochures and list of species available. Limited bookings available for guided tours of herpetological collection sites in Nevada. Call/fax (702) 450-0065. URL http://www.herp.com/crc/ E-mail: crcsafetie@aol.com.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Wanted: **Shed skins** for study dealing with melanin deposition/pattern retention in sheds. If you come across any sheds while herping this field season, please collect them and send them to me at the address below. It is recommended that you collect sheds throughout the field season and send multiple sheds towards the end of the field season (October). Please include the county and state where the sheds were collected and your name and address (contributors will be acknowledged in a future publication). Field collected sheds only please. Brian S. Gray, 1217 Clifton Drive, Erie PA 16505.

Wanted: Aberrant/unsual garter snakes. Scott, (919) 934-0110. E-mail: Sirtaliso1@aol.com. [NC]

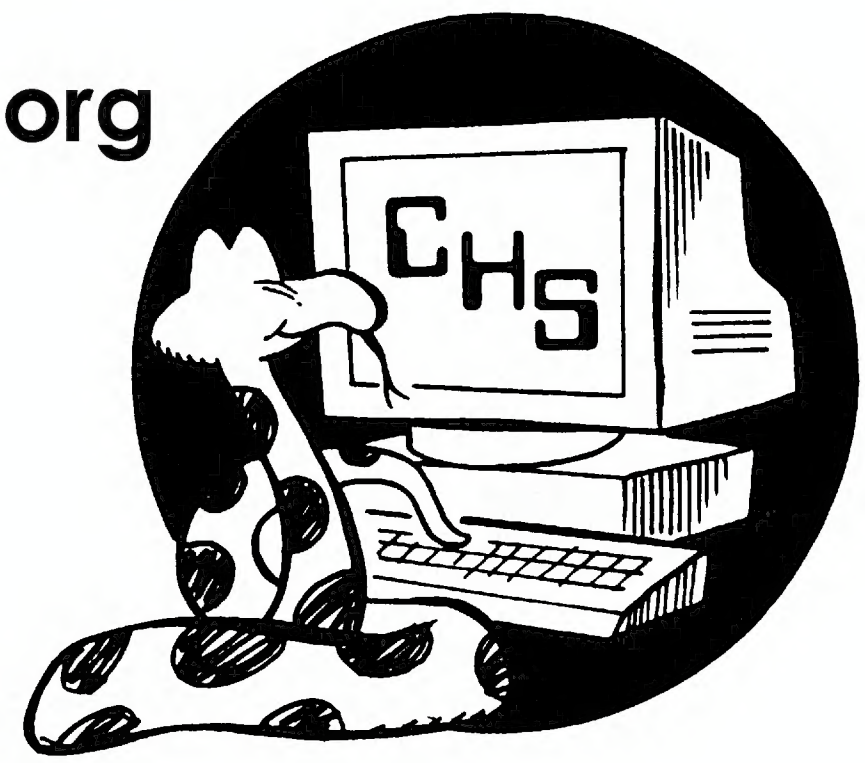
Wanted: west Florida reptile collector would like to hear from other reptile collectors from all parts of the U.S. to trade, buy, sell reptiles of all types. Tony Picheo, 11080 lillian Hiway, Pensacola FL 32506, (850) 453-8133.

Wanted: big-headed turtles; mata mata turtles; Mexican giant mud turtles (*Staurotypus triporcatus*); exceptionally large common snappers (45 lbs. & up); large alligator snappers (over 90 lbs.); spectacled caiman from Trinidad, Tobago and Surinam; dwarf caiman; smooth-fronted caiman; albino turtles (except red-eared sliders). Walt Loose, (610) 926-6028, 9:00 A.M. – 1:00 P.M. or after 11:30 P.M. Eastern Time.

Line ads in this publication are run free for CHS members — $2 per line for nonmembers. Any ad may be refused at the discretion of the Editor. Submit ads to: Michael Dloogatch, 6048 N. Lawndale Avenue, Chicago IL 60659, (773) 588-0728 evening telephone, (312) 782-2868 fax, E-mail: <MADadder0@aol.com>.

Next time you surf the WorldWide Web, crawl, run, slither, slide, jump, or hop over to the CHS web site!

www.chicagoherp.org



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Chicagoherp.org is accepting applications for banner advertisements or links from herpetoculturists and manufacturers of herp-related products. Visit the site and contact the webmaster for details on how you can sponsor CHS!

UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, July 25, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. **Dr. Martin Wikelski**, Assistant Professor in the Department of Ecology and Evolutionary Biology at Princeton University, will be our featured speaker. His topic will be the remarkable physical changes that take place in the marine iguana, *Amblyrhynchus cristatus*, in response to reduced food availability caused by El Niño. Dr. Wikelski specializes in understanding how physiological and life history traits of organisms are connected, and has been studying marine iguanas for many years.

At the August 29 meeting **Robert Lovich** of the San Diego Zoo will present a program on the herpetofauna of southern California.

The regular monthly meetings of the Chicago Herpetological Society now take place at Chicago's newest museum—the **Peggy Notebaert Nature Museum**. This beautiful new building is at Fullerton Parkway and Cannon Drive, directly across Fullerton from the Lincoln Park Zoo. Meetings are held the last Wednesday of each month, from 7:30 P.M. through 9:30 P.M. Parking is free on Cannon Drive. A plethora of CTA buses stop nearby.

Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? If so, mark your calendar for the August 17 board meeting, to be held at the North Park Village Administration Building, 5801 North Pulaski Road, Chicago. To get there take the Edens Expressway, I-94, and exit at Peterson eastbound. Go a mile east to Pulaski, turn right and go south to the first traffic light. Turn left at the light into the North Park Village complex. At the entrance is a stop sign and a guardhouse. When you come to a second stop sign, the administration building is the large building ahead and to your left. There is a free parking lot behind the building.

The Chicago Turtle Club

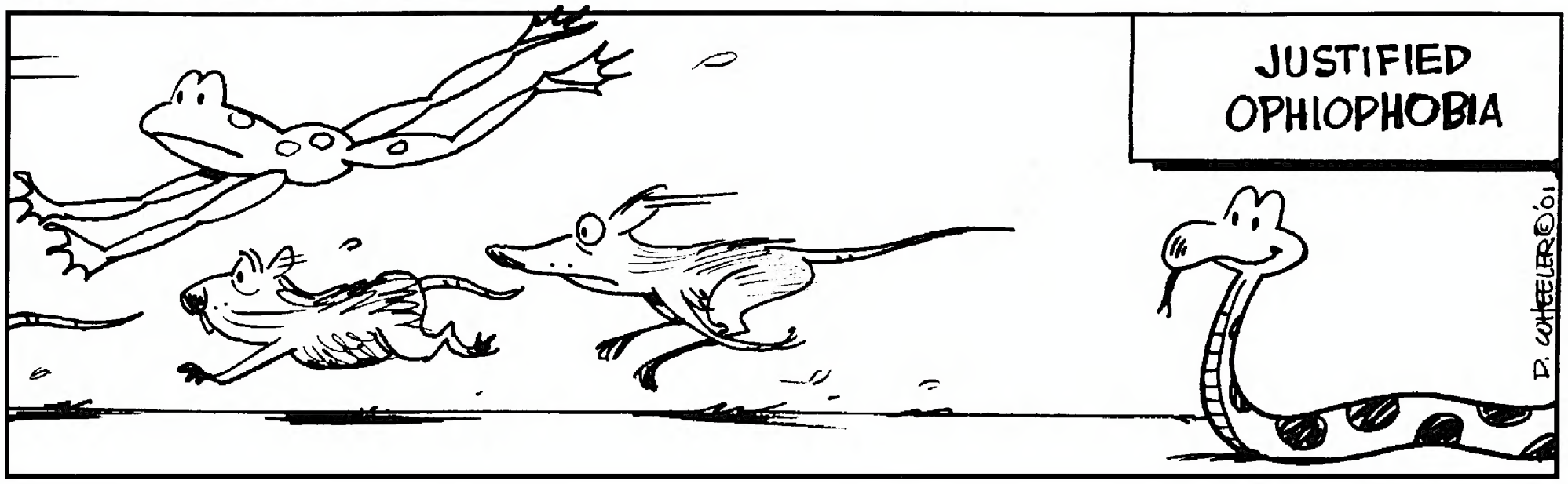
The next meeting of the Chicago Turtle Club will be on Sunday, July 29, 1:00 – 4:00 P.M., at the North Park Village Nature Center, 5801 N. Pulaski, in Chicago. Steve Spitzer and Eileen Farrell will moderate a discussion on breeding turtles, including egg incubation and raising the hatchlings. Meetings are informal; questions, children and animals are welcome. Parking is free. For more info call Lisa Koester, (773) 508-0034, or visit the CTC website: http://www.geocities.com/~chicagoturtle.

DONATIONS TO THE MAY 30 RAFFLE

The following is a listing of those businesses and individuals who generously donated items for our monthly raffle at the May 30 meeting. The donated items are shown in parentheses.

Rep-Cal (bearded dragon food); **Fancy Publications** (*Reptiles* subscription); **Tetra Terrafauna** (Sizzle Stone heat rock); **Midwest Zoological Research** (NutriBACdf supplement); **Lixit** (watering station); **Fluker** (iguana food); **Hagen** (OrnamentAlls cage decor / Reptipor deodorizer); **Super Pet** (Hanging Gardens cage decor / Floating Island / Rock Pool Cover / Island Sanctuary); **Gary Fogel** (sea turtle toy); **Jack Schoenfelder – Reptiques** (*Illustrated Encyclopedia of Animal Life*); **Emily and Will Forcade** (frog plush toy); **Lori King** (frog napkin rings / bag o' herp toys); **Charlotte Henkle** (aquarium / screen top / light and fixture); **Dr. Cheryl Roge – Best Friends Animal Hospital** (exotic background scenes); **CHS** (T-shirts / book: *Keeping and Breeding Corn Snakes*).

THE ADVENTURES OF SPOT



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